Cardiac Patient Care Guidelines

Cardiac Patient Care Guidelines

These guidelines were created to provide direction to each level of certified provider in caring for cardiac patients. All of these directions, dosages and provisions are subject to change with a later notice or revision of the guidelines. The OMLC physician will always be the final word on treatment in the field. If there are ever any discrepancies between the guidelines and the OMLC physician these should be documented and brought to the attention of the physician at the receiving hospital. If the explanation is not sufficient to the provider then they may bring the issue to the UCEMS committee for review.

General Approach to Medical Patient Care Guidelines

- Assess your patient prior to initiating a guideline
- All Cardiac patients should have an IV, Oxygen and be monitored.
- More than one guideline may apply
- When conflicts arise between treatment guidelines contact OLMC for clarification
- Providers may provide treatment up to the level of their certification only
- Air Medical Transport Service personnel function under their own clinical guidelines
- Contact your receiving hospitals and OLMC as soon as clinically possible for each patient
- Do not delay transport to attempt to complete all possible treatments in a guideline
- Getting to a facility with a higher level of care should always be a priority
- OLMC with a physician may change your treatment plan
- Any variations to a guideline by the OLMC or physician should be clarified to insure that the provider has properly characterized the situation
- The On-Line Medical Control Physician has the final word on treatment once contact is made

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Key to Symbols used in Guidelines

This symbol and yellow highlighted instructions precedes any treatment that requires OLMC prior to initiating the treatment unless otherwise specified.

ACUTE CORONARY SYNDROMES (ACS)
ACUTE MYOCARDIAL INFARCTION

ALL PROVIDERS

- ❑ Scene and patient management per Core Principles
- ❑ Continuous ECG, CO2, and Pulse Oximetry monitoring when available
- ❑ Focused history and physical exam
  - Ask patient to describe the pain utilizing the O-P-Q-R-S-T mnemonic
  - Determine whether the patient (male or female) has taken erectile dysfunction medications such as Viagra, Levitra or Cialis within the last 24 hours.
- ❑ Develop and implement treatment plan based on assessment findings, resources, and training.
  - **>160 mg baby aspirin** if patient is >18 years old and no reported allergies to aspirin
    - Administer even if patient takes a daily dose

ADULT

EMT- BASIC PROVIDER

- ❑ Assist patient with prescribed nitroglycerin SL every 5 minutes, up to 3 doses, as long as symptoms persist and SBP >100 mmHg
  - Do not administer nitroglycerin if patient (male or female) has taken erectile dysfunction medications within 24 hours.

EMT- INTERMEDIATE PROVIDER

- ❑ Vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*
- ❑ IV access prior to nitrates is preferred if possible
- ❑ **Normal Saline 250–1000 mL** IV over 15 minutes to increase preload if signs of right sided MI are present
- ❑ **Nitroglycerin 0.4 mg (every 5 minutes) (max of 3 doses)** SL as long as symptoms persist and SBP >100 mmHg
- ❑ **Pain medications per pain protocol.**

PARAMEDIC

- ❑ On-line medical consultation

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER

EMT- INTERMEDIATE PROVIDER

PARAMEDIC

- ❑ On-line medical consultation

ASYSTOLE / AGONAL
(HR <10 bpm)

ALL PROVIDERS

- ❑ See *"Cardiac Arrest Universal Management"* Guideline
- ❑ Continuous ECG, CO2, and Pulse Oximetry monitoring when available
- ❑ Consider Underlying Causes and Treat
  - 5H's - Hypovolemia, Hypoxia, Hydrogen ion (Acidosis), Hyperkalemia, Hypothermia
  - 5T's – Tablets (Overdose), Tamponade (Cardiac), Tension Pnemothorax, Thrombosis (ACS or Pulmonary)
    - Common Overdoses – ABCD – Antidepressants (Tricyclic), Betablockers, Calcium Channel Blockers, and Digoxin

ADULT

EMT- BASIC PROVIDER

- ❑ CPR

EMT - INTERMEDIATE PROVIDER

- ❑ Advanced airway, vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*
- ❑ Begin ***simultaneous therapy*** if arrest is from known treatable cause

AND

- ❑ **Epinephrine**
  - 1 mg (1:10,000) IV or IO push
    - Consider 3-5 mg if arrest is from beta blocker overdose or anaphylaxis
  - 2-2.5 mg via ET if no vascular access
  - Repeat every 3-5 minutes as long as patient remains pulseless
- ❑ **Atropine** (if rate <60 bpm)
  - 1 mg IV push
  - 2-2.5 mg via ET if no vascular access
  - Repeat Atropine every 3-5 minutes until 0.04 mg/kg (0.08 mg/kg if ET) is reached or rate is >60 bpm

PARAMEDIC

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER

- ❑ CPR

EMT - INTERMEDIATE PROVIDER

- ❑ Same as adult
- ❑ Begin ***simultaneous therapy*** if arrest is from known treatable cause

AND

- ❑ **Epinephrine**
  - 0.01 mg/kg (1:10,000) IV or IO push
  - 0.1 mg/kg (1:1,000) via ET if no IV or IO access
  - Repeat every 3-5 minutes as long as patient remains pulseless
    - May repeat initial dose **or** increase to 0.1 mg/kg (1:1,000) (IV, IO, ET)

PARAMEDIC

BRADYCARDIA (Symptomatic)

ALL PROVIDERS

- ❑ Initial Scene and Patient Management per System Core Principles
- ❑ Focused history and physical exam
- ❑ Vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*
- ❑ Continuous ECG, CO2, and Pulse Oximetry monitoring when available
- ❑ Develop and implement treatment plan based on assessment findings, resources, and training
  - Modified Trendelenburg position (with or without the torso raised) with appropriate precautions related to airway management and potential spinal cord injury
  - Ensure patient warmth
  - Pediatric patient (<8 year old)
    - Aggressive oxygenation with high flow oxygen and assisted ventilations with a BVM as indicated.
    - Persistent heart rate <60/minute and signs of poor perfusion following aggressive oxygenation and ventilation, begin chest compressions.

ADULT

EMT- BASIC PROVIDER
EMT- INTERMEDIATE PROVIDER

- ❑ **Atropine 0.5 - 1.0 mg** rapid IV bolus administered prior to, *and in conjunction with*, TCP (if available) in any patient in imminent danger of a brady-asystolic arrest.
  - Repeat as needed every 3 minutes, to a maximum total dose of 0.03-0.04 mg/kg.

PARAMEDIC

SYMPTOMATIC BRADYCARDIA

- ❑ **Transcutaneous pacing** (**TCP**) at an initial rate of 80 beats per minute as ***first line-therapy*** on any patient requiring heart rate acceleration.
  - Refer to *"Emergent Cardiac Pacing"* procedure for energy amounts and pacing steps

And Consider

Sedation for TCP

- ❑ **Midazolam (Versed) Call OLMC for additional dosing if necessary.**
  - SBP must be >100mmHg or peripheral pulses present to begin.
  - Dosage is cut in half with narcotics or alcohol.
  - Dosage should be adjusted based on the size of the patient.
  - Maintain consciousness for those who were awake.
  - **Intravenous.** Begin with 1-2mg and titrate by up to 2mg every 2 minutes to no more than 10mg maximum for an adult.
  - Allow 2 minutes between doses to see full effect before titrating further.
  - **Intramuscular.** Give 2-5mg IM.
  - Only give IM if no vascular access is available.
  - **Intranasal or oral.** Give 0.25 to 0.5 mg/kg to a maximum of 20mg as a one-time dose.
  - Preferred method of delivery is through a nasal atomizer.

- ❑ **Dopamine 2-20 mcg/kg/min** IV infusion per Chart in Appendix for hypoperfusion. Titrate to maintain a SBP >100 mmHg**.** *(Goal is to maintain a mean arterial pressure (MAP) >70 mmHg)*

Or

- ❑ **Epinephrine (1:1,000) 2–10 mcg/min** IV infusion per Chart in Appendix for hypoperfusion. Titrate to maintain a SBP >100 mmHg**. (**Epinephrine is the preferred first line medication in anaphylaxis while Dopamine is the first line medication for hypotension due to other mechanisms.)

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER
EMT- INTERMEDIATE PROVIDER

- ❑ **Epinephrine** IV/IO- **0.01 mg/kg** (1:10,000 = 0.1 mL/kg), repeat every 3-5 minutes at same dose
- ❑ **Atropine**IV/IO-**0.02 mg/kg** Minimum single dose-0.1 mg
- ❑ Max single dose - Child- 0.5 mg & Adolescent- 1.0 mg
- ❑ Repeat every 5 minutes to the maximum total dose

PARAMEDIC

IF BRADYCARDIA IS SEVERE with SIGNS OF POOR PERFUSION

- ❑ **Transcutaneous pacing** (**TCP**) at an initial rate of 100 beats per minute as ***first line-therapy***
  - Refer to *"Emergent Cardiac Pacing"* procedure for energy amounts and pacing steps

And Consider

Sedation for TCP

- ❑ **Midazolam (Versed) Call OLMC for additional dosing if necessary.**
  - SBP must be >70 + (age in years x 2) mmHg or peripheral pulses present to begin.
  - Maintain consciousness for those who were awake.
  - Dosage is cut in half with narcotics or alcohol.
  - Dosage should be based on the size of the patient.
  - **Intravenous.** Begin with 0.05 mg/kg and titrate up by 0.05mg/kg to a maximum of 0.4 mg/kg or 5mg, whichever is less.
  - Allow 2 minutes between doses to see full effect before titrating further.
  - **Intramuscular.** Give 0.1-0.15mg/kg IM.
  - Only give IM if no vascular access is available.
  - **Intranasal or oral.** Give 0.25 to 0.5 mg/kg to a maximum of 20mg as a one-time dose. Preferred method of delivery is through a nasal atomizer.

- ❑ **Dopamine 2-20 mcg/kg/min** IV infusion per Chart in Appendix for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg **OR**
- ❑ **Epinephrine (1:1,000) 0.1–1 mcg/kg/min** IV infusion per Chart in Appendix for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg. (Epinephrine is the preferred first line medication in anaphylaxis while Dopamine is the first line medication for hypotension due to other mechanisms.)

CARDIAC ARREST UNIVERSAL MANAGEMENT

ALL PROVIDERS

- ❑ Scene and patient management per Core Principles
- ❑ Focused history and physical exam
  - Assess for evidence that resuscitation should not be attempted
  - Spinal motion restriction per algorithm (as indicated)
- ❑ Develop and implement treatment plan based on assessment findings, resources, and training
  - Airway, ventilations, compressions, and defibrillation per *Resuscitation and Perfusion Core Principle*
  - Maintain Patient warmth
  - Assess blood glucose level
  - Pregnancy >20 weeks gestation
    - Place wedge-shaped cushion or multiple pillows under patient's right hip
- ❑ Continuous ECG, CO_2, and Pulse Oximetry monitoring when available

ADULT

EMT- BASIC PROVIDER

EMT - INTERMEDIATE PROVIDER

- ❑ Advanced airway, vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*
- ❑ **Epinephrine**
  - 1 mg (1:10,000) IV or IO push
    - Consider 3-5 mg if arrest is from beta blocker overdose or anaphylaxis
  - 2-2.5 mg via ET if no vascular access
  - Repeat every 3-5 minutes as long as patient remains pulseless

PARAMEDIC

- ❑ Apply patient therapy pads

PEA WITH BLUNT AND/OR PENETRATING TRUNCAL TRAUMA

(PEA **+** diminished or absent lung sounds **+** poor BVM compliance and/or ventilation)

- ❑ Immediate needle decompression

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER

EMT - INTERMEDIATE PROVIDER

- ❑ Same as adult
- ❑ **Epinephrine**
  - 0.01 mg/kg (1:10,000) IV or IO push
  - 0.1 mg/kg (1:1,000) via ET while vascular access is established
  - Repeat every 3-5 minutes as long as patient remains pulseless
    - May repeat initial dose **or** increase to 0.1 mg/kg (1:1,000) (IV, IO, ET)

PARAMEDIC

- ❑ Apply patient therapy pads

PEA WITH BLUNT AND/OR PENETRATING TRUNCAL TRAUMA

(PEA **+** diminished or absent lung sounds **+** poor BVM compliance and/or ventilation)

- ❑ Immediate needle decompression

CONGESTIVE HEART FAILURE/PULMONARY EDEMA

ALL PROVIDERS

- ❑ Scene and patient management per Core Principles
- ❑ Focused history and physical exam
  - Determine whether the patient (male or female) has taken erectile dysfunction medications such as Viagra, Levitra or Cialis within the last 24 hours
- ❑ Develop and implement treatment plan based on assessment findings, resources, and training
- ❑ Continuous ECG, CO2, and Pulse Oximetry monitoring when available
- ❑

ADULT

EMT- BASIC PROVIDER

- ❑ Assist patient with prescribed nitroglycerin SL every 5 minutes, up to 3 doses, as long as symptoms persist and SBP >100 mmHg
  - Do not administer nitroglycerin if the patient (male or female) has taken erectile dysfunction medications within the last 24 hours.

EMT- INTERMEDIATE PROVIDER

- ❑ Advanced airway, vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*
  - IV access prior to nitrates is preferred if possible
  - Limit fluid bolus to 250–500 mL NS
- ❑ **Albuterol 2.5 mg** nebulized only for patient with significant bronchospasm/wheezing
- ❑ **Nitroglycerin 0.4 mg (every 5 minutes) (max of 3 doses)** SL if symptoms persist and SBP >100 mmHg. Maximize Nitroglycerin before considering Morphine.
- ❑ **Morphine Sulfate 2–15mg (2-4 mg max increments)** IV titrated to effect to produce peripheral vasodilation for reduction of preload and afterload pressures on the heart if SBP remains >100 mmHg

PARAMEDIC

- ❑ **Furosemide –** Give 40 mg IV to the patient if they do not take it by prescription and if SBP >100 mmHg
  OR
  Give IV two (2) times patient's prescribed oral dose up to maximum of 120 mg if SBP >100 mmHg
- ❑ **Dopamine 2-20 mcg/kg/min** IV infusion per Chart in Appendix for hypoperfusion. Titrate to maintain a SBP >100 mmHg**.** *(Goal is to maintain a mean arterial pressure (MAP) >70 mmHg)*

And/Or

- ❑ **Epinephrine (1:1,000) 2–10 mcg/min** IV infusion per Chart in Appendix for hypoperfusion. Titrate to maintain a SBP >100 mmHg**. (**Epinephrine is the preferred first line medication in anaphylaxis while Dopamine is the first line medication for hypotension due to other mechanisms.)

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER

EMT- INTERMEDIATE PROVIDER

PARAMEDIC

- ❑ Contact On-Line Medical Consultation

DETERMINATION OF DEATH AND PRONOUNCEMENT PROCESS

ALL PROVIDERS

- ❑ Scene and patient management per *System Core Principles*
  - Per *General Crime Scene Management Principles* as appropriate
- ❑ **Initiation** of CPR is **not** indicated in a pulseless, apneic patient in the presence of
  - Obvious death, Decomposition, and/or Rigor Mortis.
  - Obvious mortal wounds (massive burn injuries, severe traumatic injuries with obvious signs of organ destruction such as brain, thoracic contents, etc)
    - Severe extremity damage, including amputation, should **not** be considered an obvious mortal wound without coexistent injury/illness
  - A valid verbal order from a licensed physician in the State of Utah on scene as provided for in the Core Principles of *Interacting with On-Scene Healthcare Professionals*
  - An Order by the OLMC physician
  - A Valid Out-Of-Hospital Do Not Resuscitate (DNR) Written Order or Device from any (US) State (may be used to **not** initiate or **terminate** resuscitative efforts) which includes:
    - A Patient Health Care Directive document signed by a physician, witnessed, notarized and recognized as a directive for end of life care meeting the standards discussed in **Section One: Professional Practice** *On-Scene Resuscitation Special Considerations* Section of the Utah County COG
    - A Utah EMS/DNR declaration document or bracelet as provided for by Utah State Code 75-2-1105.5
- ❑ **Termination** of CPR may be done in the following circumstances:
  - A Valid Out of Hospital (DNR) Directive is discovered after resuscitative efforts were initiated
  - Resuscitation efforts initiated when criteria to **not** resuscitate were present
  - A valid verbal order from a licensed physician in the State of Utah on scene as provided for in the Core Principles of *Interacting with On-Scene Healthcare Professionals*
  - Ordered by the OLMC physician.
- ❑ Following determination of obvious death or Termination of resuscitative efforts
  - Call dispatch to reduce any responding transport(s) to Code 1
  - Document according to System and Agency protocols
  - Turn the patient over to the appropriate law enforcement agency
  - Contact the closest facility and make them aware of the actions taken, declare a time of death and explain the disposition of the patient.

ADULT

EMT- BASIC PROVIDER
EMT- INTERMEDIATE PROVIDER

- ❑ Blunt traumatic arrest
  - With clearly associated mechanism to the head and/or torso region AND
  - Lack of spontaneous respirations following BLS airway maneuver
- ❑ Penetrating traumatic arrest with clearly associated mechanism to the head and/or torso region
  - When arrival at the hospital would exceed 20 minutes from arrival of the 1st Credentialed Provider

  -OR-
  - Lack of spontaneous respirations following BLS airway maneuver **AND**
  - No evidence of organized electrical activity (**rate >30)** on ECG **(if a monitor is not available, initiate CPR until a monitor is available) AND**
  - No evidence of signs of life, specifically pupillary reflexes or spontaneous movement
- ❑ ECG monitor becomes available in penetrating traumatic arrest after First Responders initiated resuscitation and monitor demonstrates patient does **not** have **electrical heart rate >30 bpm** the follow the previous bulleted information.
- ❑ Termination of ongoing BLS resuscitation attempts of 20 minutes or more without Return of Spontaneous Circulation (ROSC) and no shocks indicated by AED/monitor (if available)
  - If at anytime during resuscitation attempts, ROSC is achieved, the 20 minute timeline should be restarted
  - Requires OLMC in Hypothermia and after intubation

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER
EMT- INTERMEDIATE PROVIDER

- When OLMC is involved in the decision to terminate resuscitative efforts, the following procedures should be implemented:
  - Ensure resuscitation efforts continue during consultation
  - Get permission from the OLMC physician to terminate resuscitation efforts or follow their instructions
- Document according to System and Agency protocols, OLMC and Transport is required after ongoing resuscitation attempts of 20 minutes or more using ACLS/PALS interventions with no Return of Spontaneous Circulation (ROSC) in the following circumstances:
  - Hypothermia
  - Persistent Ventricular Fibrillation
  - Ventricular Tachycardia

Attempted resuscitation with intubation of the patient

PARAMEDIC

PARAMEDIC

- Same as adult

KEY POINTS/CONSIDERATIONS

- There will always be patients and circumstances that deserve special consideration (pediatric drowning or pregnant patients for instance). OMLC should be made if there are ever any questions. Always be sensitive to the patient's desires, family concerns, and on-scene environment to insure an understanding by all who observe your actions that everything that could and should have been done to resuscitate the patient was done.

NEWBORN RESUSCITATION

ALL PROVIDERS

- ❑ Scene and patient management per Core Principles
- ❑ Focused history and physical exam
- ❑ Continuous ECG, CO_2, and Pulse Oximetry monitoring when available
- ❑ Develop and implement treatment plan based on assessment findings, resources, and training
  - Apnea
    - Suction (bulb syringe) mouth, then nose
      - If power suction is used, negative pressure must be regulated to not exceed 100 mm Hg
    - Tactile stimulation
    - Manual airway maneuvers
    - Ventilations with supplemental oxygen at 40-60/min
  - Slow or gasping respirations
  - Heart rate <100
  - Persistent central cyanosis
  - Slow to respond
    - Suction (bulb syringe) mouth, then nose
    - Ensure neonate is dry and warm
    - Tactile stimulation
    - Manual airway maneuvers
    - Blow-by oxygen
    - Assisted ventilations with supplemental oxygen at 40-60/min
  - Heart rate below 60 beats/min
    - Assisted ventilations with supplemental oxygen at 40-60/min for at least 30 seconds
    - If no improvement following ventilations, begin chest compressions at a compression/ventilation ratio of 3:1 and a rate of 120 events per minute
  - Glucose assessment via heel stick - Oral glucose is **not** indicated in the newborn

EMT- BASIC PROVIDER
EMT - INTERMEDIATE PROVIDER

- ❑ Endotracheal intubation is indicated when
  - Meconium aspiration with depressed respirations, decreased muscle tone, or heart rate <100 bpm
  - BVM ventilation is ineffective
  - Chest compressions are performed
  - Tracheal medications are required
    - Insert a gastric tube in all intubated patients
- ❑ IV or IO NS at a keep open (approx. 10cc/hr) rate to avoid volume overload
  - Only when required for fluid resuscitation or parenteral medication
  - IO infusions are only indicated when life-threatening conditions are present
- ❑ **Epinephrine**
  - 0.01-0.03 mg/kg (1:10,000) IV or IO
  - 0.1 mg/kg (1:1,000) via ET while vascular access is established
  - Repeat every 3-5 minutes if heart rate remains <80 bpm
- ❑ **Naloxone (Narcan) 0.1mg/kg** repeated every 2-3 min as needed for babies of suspected narcotic addicted mothers

EVIDENCE OF HYPOPERFUSION OR HYPOVOLEMIA

- ❑ IV or IO NS @ 10 mL/kg syringe bolus over 5-10 min
  - ✆ Additional boluses require physician approval

PARAMEDIC

HEART RATE REMAINS <80 BPM
FOLLOWING CHEST COMPRESSIONS, OXYGENATION, AND VENTILATION

- ❑ **Dextrose 10%** per "*Glucose Abnormalities, Hypoglycemia/Hyperglycemia"* Guidelines

OPTIONAL ORDERS BY MEDICAL CONSULTATION ONLY

✆ **Sodium bicarbonate** 1-2 mEq/kg IV or IO

POST RESUSCITATION

ALL PROVIDERS

- ❑ Scene and patient management per Core Principles
- ❑ Focused history and physical exam
- ❑ Develop and implement treatment plan based on assessment findings, resources, and training
- ❑ Continuous ECG, CO2, and Pulse Oximetry monitoring when available

ADULT

EMT- BASIC PROVIDER

EMT- INTERMEDIATE PROVIDER

- ❑ Advanced airway, vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*
- ❑ **Without previous antiarrhythmic therapy during arrest**
  - **Lidocaine 0.5-1.5 mg/kg** IV push, (if not given Lidocaine during the arrest), followed by continuous infusion per Chart in Appendix of 2-4 mg/min

PARAMEDIC

- ❑ **With previous Lidocaine therapy during arrest**
  - **Lidocaine**, begin continuous infusion per Chart in Appendix of 2-4 mg/min
- ❑ **Dopamine 2-20 mcg/kg/min** IV infusion per Chart in Appendix for hypoperfusion. Titrate to maintain a SBP >100 mmHg**.** *(Goal is to maintain a mean arterial pressure (MAP) >70 mmHg)*

And/Or

- ❑ **Epinephrine (1:1,000) 2–10 mcg/min** IV infusion per Chart in Appendix for hypoperfusion. Titrate to maintain a SBP >100 mmHg**. (**Epinephrine is the preferred first line medication in anaphylaxis while Dopamine is the first line medication for hypotension due to other mechanisms.)

POST RESUSCITATION SVT

- ❑ Observe for 2 minutes. If SVT persists or BP drops see *"Narrow - Complex Tachycardias"* Guidelines

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER

EMT- INTERMEDIATE PROVIDER

- ❑ Advanced airway, vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*
- ❑ Blood glucose assessment
- ❑ **Without previous antiarrhythmic therapy during arrest**
  - **Lidocaine 1 mg/kg** IV push, (if not given Lidocaine during the arrest), followed by continuous infusion per Chart in Appendix of 20-50 mcg/kg/min

PARAMEDIC

- ❑ **With previous Lidocaine therapy during arrest**
  - **Lidocaine,** begin continuous infusion per Chart in Appendix of 20-50 mcg/kg/min
- ❑ **Dopamine 2-20 mcg/kg/min** IV infusion per Chart in Appendix for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg

OR

- ❑ **Epinephrine (1:1,000) 0.1–1 mcg/kg/min** IV infusion per Chart in Appendix for hypoperfusion. Titrate to maintain a SBP >70 + (age in years x 2) mmHg. (Epinephrine is the preferred first line medication in anaphylaxis while Dopamine is the first line medication for hypotension due to other mechanisms.)

POST RESUSCITATION SVT

- ❑ Observe for 2 minutes. If SVT persists or BP drops see *"Narrow - Complex Tachycardias"* Guidelines

PULSELESS ELECTRICAL ACTIVITY (PEA)

ALL PROVIDERS

- ❑ See *"Cardiac Arrest Universal Management"* Guideline
- ❑ Continuous ECG, CO2, and Pulse Oximetry monitoring when available
- ❑ Consider Underlying Causes and Treat
  - 5H's - Hypovolemia, Hypoxia, Hydrogen ion (Acidosis), Hyperkalemia, Hypothermia
  - 5T's – Tablets (Overdose), Tamponade (Cardiac), Tension Pnemothorax, Thrombosis (ACS or Pulmonary)
    - Common Overdoses – ABCD – Antidepressants (Tricyclic), Betablockers, Calcium Channel Blockers, and Digoxin

ADULT

EMT- BASIC PROVIDER

EMT - INTERMEDIATE PROVIDER

- ❑ Advanced airway, vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*
- ❑ CPR
- ❑ Begin ***simultaneous therapy*** if arrest is from known treatable cause

AND

- ❑ **Epinephrine**
  - 1 mg (1:10,000) IV or IO push
    - Consider 3-5 mg if arrest is from beta blocker overdose or anaphylaxis
  - 2-2.5 mg via ET if no vascular access
  - Repeat every 3-5 minutes as long as patient remains pulseless
- ❑ **Atropine** (if rate <60 bpm)
  - 1 mg IV push
  - 2-2.5 mg via ET if no vascular access
  - Repeat Atropine every 3-5 minutes until 0.04 mg/kg (0.08 mg/kg if ET) is reached or rate is >60 bpm

PARAMEDIC

- ❑ Establish OLMC for further orders or therapies

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER

EMT - INTERMEDIATE PROVIDER

- ❑ Same as adult
- ❑ CPR
- ❑ Begin ***simultaneous therapy*** if arrest is from known treatable cause

AND

- ❑ **Epinephrine**
  - 0.01 mg/kg (1:10,000) IV or IO push
  - 0.1 mg/kg (1:1,000) via ET while vascular access is established
  - Repeat every 3-5 minutes as long as patient remains pulseless
    - May repeat initial dose **or** increase to 0.1 mg/kg (1:1,000) (IV, IO, ET)

PARAMEDIC

- ❑ Establish OLMC for further orders or therapies

TACHYCARDIA – NARROW COMPLEX
(with Pulses)

ALL PROVIDERS

- ❑ Initial Scene and Patient Management per System Core Principles
- ❑ Focused history and physical exam
- ❑ Develop and implement treatment plan based on assessment findings, resources, and training
- ❑ Continuous ECG, CO2, and Pulse Oximetry monitoring when available

ADULT

EMT- BASIC PROVIDER

EMT- INTERMEDIATE PROVIDER

- ❑ Vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*

PARAMEDIC

SUPRAVENTRICULAR TACHYCARDIA

- ❑ Maneuvers to increase vagal tone (valsalva, ice pack to face,* Trendelenburg etc.)

Unstable Tachycardia – Narrow Complex (Supraventricular Tachycardia, Atrial Fibrillation or Atrial Flutter)

If no response to previous interventions and patient has "Serious Signs or Symptoms":

- Cardiac Chest Pain
- Active Congestive Heart Failure
- Acute Myocardial Infarction
- Acute Pulmonary Edema
- SBP < 100 mm Hg with peripheral signs of shock:
  - Cool, clammy, or pale skin
  - Agitated mental status
  - Weak or thready pulse

- ❑ **Synchronized Cardioversion**
  - Indicated for unstable patients
  - Begin at 50 J and if no response, increase energy to 100 J, 200 J, 300 J and 360 J, as needed (NOTE: These numbers are monophasic dosages)
  - IF you have a biphasic defibrillator that does NOT convert then use 75J, 120J, 150J, and 200J as needed.
  - Follow your manufacturer's recommendations if different than this guideline.

✆ Contact with OLMC for further instructions

Sedation prior to Cardioversion

- ❑ **Midazolam (Versed) Call OLMC for additional dosing if necessary.**
  - SBP must be >100mmHg or peripheral pulses present to begin.
  - Dosage is cut in half if the patient has received narcotics or alcohol.

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER

EMT- INTERMEDIATE PROVIDER

- ❑ Same as adult

PARAMEDIC

PROBABLE SUPRAVENTRICULAR TACHYCARDIA

Infants: rate usually greater than 220 bpm
Children: rate usually greater than 180 bpm

- ❑ Maneuvers to increase vagal tone (valsalva, ice pack to face, * Trendelenburg etc.)

Unstable Tachycardia – Narrow Complex (Supraventricular Tachycardia, Atrial Fibrillation or Atrial Flutter)

If no response to previous interventions and patient has "Serious Signs or Symptoms":

- Cardiac Chest Pain
- Active Congestive Heart Failure
- Acute Myocardial Infarction
- Acute Pulmonary Edema
- SBP < 100 mm Hg with peripheral signs of shock:
  - Cool, clammy, or pale skin
  - Agitated mental status
  - Weak or thready pulse

- ❑ **Synchronized Cardioversion**
  - Indicated immediately in the unstable patient
  - Initial energy dose is 0.5 J/kg
  - If no response and tachydysrhythmia persists, double energy dose to 1 J/kg
  - Follow your manufacturer's recommendations if different than this guideline.

✆ Repeat as needed at 1 J/kg while establishing contact with OLMC for further instructions

Sedation prior to Cardioversion

- ❑ **Midazolam (Versed) Call OLMC for additional dosing if necessary.**
  - SBP must be >70 + (age in years x 2)

    - Dosage should be adjusted based on the size of the patient.
    - Maintain consciousness for those who are awake prior to treatment.
- **Intravenous.** Begin with 1-2mg and titrate by up to 2mg every 2 minutes to no more than 10mg maximum for an adult.
    - Allow 2 minutes between doses to see full effect before titrating further.
- **Intramuscular.** Give 2-5mg IM.
    - Only give IM if no vascular access is available.
- **Intranasal or oral.** Give 0.25 to 0.5 mg/kg to a maximum of 20mg as a one-time dose.
    - Preferred method of delivery is through a nasal atomizer.

mmHg or peripheral pulses present to begin.
- Maintain consciousness for those who are awake prior to treatment.
- Dosage is cut in half if the patient has received narcotics or alcohol.
- Dosage should be adjusted based on the size of the patient.
- **Intravenous.** Begin with 0.05 mg/kg and titrate up by 0.05mg/kg to a maximum of 0.4 mg/kg or 5mg, whichever is less.
- Allow 2 minutes between doses to see full effect before titrating further.
- **Intramuscular.** Give 0.1-0.15mg/kg IM.
- Only give IM if no vascular access is available.
- **Intranasal or oral.** Give 0.25 to 0.5 mg/kg to a maximum of 20mg as a one-time dose.
- Preferred method of delivery is through a nasal atomizer.

VENTRICULAR FIBRILLATION
PULSELESS VENTRICULAR TACHYCARDIA

ALL PROVIDERS

- ❑ See "*Cardiac Arrest Universal Management"* Guideline
- ❑ Begin CPR
- ❑ Continuous ECG, CO2, and Pulse Oximetry monitoring when available

ADULT

EMT- BASIC PROVIDER

- ❑ Defibrillation immediately if AED or manual defibrillator is available and arrest is witnessed.
- ❑ If un-witnessed or defibrillator is not immediately available defibrillate after 5 cycles of CPR.
- ❑ Continue CPR by providing 5 cycles of CPR after each shock.
- ❑ Check pulses after shocking the patient and completion of 5 cycles of CPR

EMT - INTERMEDIATE PROVIDER

- ❑ Advanced airway, vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*
- ❑ Defibrillation at 360J for a monophasic defibrillator or 200J for a biphasic.

PERSISTENT OR RECURRENT VF/VT PRESENT

- ❑ Begin ***simultaneous therapy*** if arrest is from known treatable cause (Refer to PEA for List)
- ❑ **Epinephrine**
  - 1 mg (10,000) IV push
    - Consider 3-5 mg if arrest is from beta blocker overdose or anaphylaxis
  - 2-2.5 mg via ET if no vascular access
  - Repeat every 3-5 minutes

ANTIARRHYTHMICS

- ❑ Treatment pattern is shock, drug, shock, drug, shock
- ❑ **Lidocaine**
  - **1-1.5 mg/kg** IV push or one time dose of 1.5 mg/kg
  - May repeat every 3-5 min up to 3 mg/kg

PARAMEDIC

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER

- ❑ Same as adult

EMT - INTERMEDIATE PROVIDER

- ❑ Same as adult
- ❑ Defibrillation at 2 J/kg for a monophasic or biphasic defibrillator.

PERSISTENT OR RECURRENT VF/VT PRESENT

- ❑ Begin ***simultaneous therapy*** if arrest is from known treatable cause (Refer to PEA for List)
- ❑ **Epinephrine**
  - 0.01 mg/kg (1:10,000) IV or IO push
  - 0.1 mg/kg (1:1,000) via ET while vascular access is established
  - Repeat every 3-5 minutes
    - May repeat initial dose **or** increase to 0.1 mg/kg (1:,000) (IV, IO, ET)

ANTIARRHYTHMICS

- ❑ Treatment pattern is shock, drug, shock, drug, shock.
- ❑ **Lidocaine**
  - **1 mg/kg** IV, IO, or ET
- ❑ May repeat every 3-5 minutes up to 3 mg/kg

PARAMEDIC

VENTRICULAR TACHYCARDIA OR WIDE-COMPLEX OF UNKNOWN TYPE
(with Pulses)

ALL PROVIDERS

- ❑ Initial Scene and Patient Management per System Core Principles
- ❑ Focused history and physical exam
- ❑ Develop and implement treatment plan based on assessment findings, resources, and training
- ❑ Continuous ECG, CO2, and Pulse Oximetry monitoring when available

ADULT

EMT- BASIC PROVIDER

EMT- INTERMEDIATE PROVIDER

- ❑ Vascular access and fluid therapy per *Resuscitation and Perfusion Core Principle*

VENTRICULAR TACHYCARDIA

-OR-

Implantable cardioverter defibrillator (ICD) patient with VT

(If VT is sustained, or ICD fails to convert rhythm)

-OR-

Wide-complex tachycardia of uncertain type with no serious signs or symptom

(No serious signs or symptoms, hemodynamically stable)

- ❑ **Lidocaine 1-1.5 mg/kg** IV push
  - No greater than 50 mg per minute

Repeat the following every 5 to 10 minutes

- ❑ **Lidocaine 0.5-0.75 mg/kg** IV push
  - No greater than 50 mg per minute until max dose of 3 mg/kg is reached, arrhythmia is suppressed, or patient becomes unstable.
  - If conversion occurs from Lidocaine, begin infusion per Chart in Appendix at 2-4 mg per minute

PEDIATRIC (<37 kg or 80 lbs)

EMT- BASIC PROVIDER

EMT- INTERMEDIATE PROVIDER

- ❑ Same as adult

VENTRICULAR TACHYCARDIA
(QRS duration wide >0.08 seconds)

- ❑ **Lidocaine 1 mg/kg** IV
  - Do not delay cardioversion to administer
  - If conversion occurs from Lidocaine, begin infusion per Chart in Appendix at **20-50 mcg/kg/min**

UNSTABLE VENTRICULAR TACHYCARDIA

If no response to previous interventions and patient has "Serious Signs or Symptoms":

- Cardiac Chest Pain
- Active Congestive Heart Failure
- Acute Myocardial Infarction
- Acute Pulmonary Edema
- SBP < 100 mm Hg with peripheral signs of shock:
  - Cool, clammy, or pale skin
  - Agitated mental status
  - Weak or thready pulse

❑ **Synchronized Cardioversion**

- Indicated for unstable patients
- Begin at 100 J and if no response, increase energy to 200 J, 300 J and 360 J, as needed (NOTE: These numbers are monophasic dosages)
- IF you have a biphasic defibrillator that does NOT convert then use 75J, 120J, 150J, and 200J as needed.
- Follow your manufacturer's recommendations if different than this guideline.

℈ Contact with OLMC for further instructions

Sedation prior to Cardioversion

❑ **Midazolam (Versed) Call OLMC for additional dosing if necessary.**

- SBP must be >100mmHg or peripheral pulses present to begin.
- Dosage is cut in half if the patient has received narcotics or alcohol.
- Dosage should be adjusted based on the size of the patient.
- Maintain consciousness for those who are awake prior to treatment.

- **Intravenous.** Begin with 1-2mg and titrate by up to 2mg every 2 minutes to no more than 10mg maximum for an adult.
  - Allow 2 minutes between doses to see full effect before titrating further.
- **Intramuscular.** Give 2-5mg IM.
  - Only give IM if no vascular access is available.
- **Intranasal or oral.** Give 0.25 to 0.5 mg/kg to a maximum of 20mg as a one-time dose.
  - Preferred method of delivery is through a nasal atomizer.

PARAMEDIC

If no response to previous interventions and patient has "Serious Signs or Symptoms":

- Cardiac Chest Pain
- Active Congestive Heart Failure
- Acute Myocardial Infarction
- Acute Pulmonary Edema
- SBP < 100 mm Hg with peripheral signs of shock:
  - Cool, clammy, or pale skin
  - Agitated mental status
  - Weak or thready pulse

❑ **Synchronized Cardioversion**

- Indicated immediately in the unstable patient
- Initial energy dose is 0.5 J/kg
- If no response and tachydysrhythmia persists, double energy dose to 1 J/kg
- Follow your manufacturer's recommendations if different than this guideline.

℈ Repeat as needed at 1 J/kg while establishing contact with OLMC for further instructions

Sedation prior to Cardioversion

❑ **Midazolam (Versed) Call OLMC for additional dosing if necessary.**

- SBP must be >70 + (age in years x 2) mmHg or peripheral pulses present to begin.
- Maintain consciousness for those who are awake prior to treatment.
- Dosage is cut in half if the patient has received narcotics or alcohol.
- Dosage should be adjusted based on the size of the patient.

- **Intravenous.** Begin with 0.05 mg/kg and titrate up by 0.05mg/kg to a maximum of 0.4 mg/kg or 5mg, whichever is less.
  - Allow 2 minutes between doses to see full effect before titrating further.
- **Intramuscular.** Give 0.1-0.15mg/kg IM.
  - Only give IM if no vascular access is available.
- **Intranasal or oral.** Give 0.25 to 0.5 mg/kg to a maximum of 20mg as a one-time dose.
  - Preferred method of delivery is through a nasal atomizer.